

Developing RNA Vaccines to Manage Pepino Mosaic Virus

Applicant:

State University

Abstract:

Partner with State University (the University) to explore the mechanisms of the induced resistance of Pepino mosaic virus in tomatoes and to develop novel immunization approaches to induce the resistance

Project Purpose:

This one year project proposes to develop novel approaches to immunize tomato plants against Pepino mosaic virus (PepMV). Specific objectives are to determine if the naturally induced resistance in tomatoes is mediated by RNA-based immunity, develop two alternate vaccines that can effectively induce the resistance, protect tomato plants from PepMV, and eliminate the risk of late PepMV outbreaks.

Fresh tomato production in the U.S. is valued at \$1.4 billion annually. Tomato production, particularly greenhouse tomato production, has expanded rapidly within the State between 2004 and 2008. However, the emergence of PepMV as a pathogen poses a serious challenge to the tomato industry. Infection by the virus affects the quality of fruit and reduces its size, which results in up to 38 percent of the tomato fruit becoming downgraded.

Some tomato plants have been observed to recover naturally from an early infection. These plants then exhibit neither the symptoms nor the effects of PepMV infection, and continue to produce normal tomato fruit without yield loss, as if they have become resistant. Scientists have observed similar recoveries from viral infections in other plant species. Studies in the last decade have revealed that this type of recovery is due to RNA interference (RNAi). RNAi has the ability to detect and degrade invading viral and other nucleic acids. If the recovery of tomato plants from an early PepMV infection is indeed a manifestation of RNAi-based resistance, it opens up the possibility of immunizing tomato plants with a sequence fragment or an attenuated strain of PepMV.

The University presently has received matching funds from the USDA Special Projects Grant Program to provide one-half salary for the Senior Research Specialist. This individual will coordinate most of the laboratory operations and perform a majority of the laboratory and greenhouse experiments. This project will not be a duplicative effort, but rather enhance the program by providing additional dollars to elevate the part-time position to full time status.

Potential Impact:

With 3,808,556 cartons produced in 2008, the tomato is one of the top ten commodities in the State. Diseases and pests have caused major problems for fresh tomato production in the State, resulting in financial hardship for some growers. Smaller growers are facing these problems as well. Developing effective and practical means to control PepMV, as proposed in this project, will provide timely and much needed assistance to the State tomato growers. By managing the viral disease, growers will be able to improve tomato yield and quality, consequently increasing

profits. In turn, these operations will attract more businesses to the State, making the State's tomato industry more competitive.

Expected Measurable Outcomes:

Characterize the natural resistance of tomatoes to PepMV and develop a vaccine to protect tomato plants from PepMV (**GOAL**) in fresh tomato production. No such knowledge and technology currently exist (**BENCHMARK**). To disseminate this new knowledge and technology, research findings will be presented to over 100 growers at the 2010 annual Agricultural Center Field Day and over 1500 scientists at the 2010 annual American Phytopathology Meeting (**TARGETS**). The success of the project will be measured by attendance (**PERFORMANCE MEASURE**) at both meetings.

Work Plan:

Project Activity	Who's Responsible	Timeline
Determine if RNAi is involved in the natural resistance	University Researchers and Students	Sept. 2009 – Jan. 2010
Construct an infectious cDNA clone for PepMV	University Researchers and Students	Oct. 2009 – Jan. 2010
Construct an RNA immunization vector	University Researchers and Students	Jan. 2010 – Feb. 2010
Develop an attenuated PepMV strain	University Researchers and Students	Jan. 2010 – May 2010
Test the efficacy of the immunization vector	University Researchers and Students	March 2010 – June 2010
Test the protection of tomato plants using the attenuated PepMV strain	University Researchers and Students	June 2010 – Aug. 2010
Results presentation at APS	Project Investigator	Aug. 07-10, 2010
Results presentation and dissemination at AC field day	Project Investigator	Nov. 6, 2010

Budget Narrative (Total \$63,523.00):

Funding Cycle FY09	Budget	Match
Personnel		
PI Dr. Jones (.20 FTE)	\$0.00	\$13,554.80
Research Specialist, Senior (.05 FTE)	21,000.00	0.00
Undergraduate Students, 2, part-time	5,000.00	0.00
Total PS	\$26,000.00	\$13,554.80
Employee Related Expenses - Fringe Benefits		
PI Dr. Jones (28.9% ERE)	0.00	3,917.34
Research Specialist, Senior (44.7% ERE)	9,387.00	0.00
Undergraduate Students, 2, part-time (3.3% ERE)	165.00	0.00
Total ERE	\$9,552.00	\$3,917.34
In-State Travel		
Lodging	120.00	0.00
Meals	174.00	0.00
Mileage	224.00	0.00
Total In-State Travel	\$518.00	\$0.00
Out-State Travel		
Lodging	495.00	0.00
Meals	245.00	0.00
Mileage	350.00	0.00
Total In-State Travel	\$1,090.00	\$0.00
Other Operating Expenses		
Supplies	14,830.00	
Publications	2,500.00	0.00
Greenhouse Rental	3,000.00	0.00
Total OOE	\$20,330.00	\$0.00
Equipment		
PCR thermocycler, Real-time PCR iCycler	5,000.00	0.00
Total Equipment	\$5,000.00	\$0.00
TOTAL PROJECT COSTS	\$62,490.00	\$17,472.14

Personnel (\$27,000.00)

Expenses of \$21,000.00 are requested for one half-time Senior Research Specialist (0.5 FTE) who will coordinate most of the laboratory operations and perform a majority of the laboratory

and greenhouse experiments. Additionally, the specialist will be responsible for data entry and record keeping. An additional \$6,000.00 is requested to support two undergraduate student researchers. The undergraduate students will work in Dr. Jones' laboratory and learn experimental skills while assisting the Project Investigator (PI) and the research specialist in various aspects of the project.

Fringe Benefits (\$9,585.00)

The current fringe benefit rates at the University are 44.74% (\$9,387.00) for the research specialist, 3.3% (\$198.00) for undergraduate students.

Travel (\$1,608.00)

Total funds of \$518.00 are requested for in-state travel to conduct field surveys of PepMV in City X (2 overnight trips) and in City Y (2 day trips) and to attend the annual Agricultural Center Field Day (1 day trip). The total in-state travel cost will consist of car rental (7 days @ \$32.00/day), lodging (2 nights @ \$60.00), and food (6 days @ \$29.00/day). In addition, \$1,090.00 in out-of-state travel funds are requested to defray the travel expense for the PI or designee to attend and present their research findings at the annual American Phytopathological Society meeting in Nashville, TN in 2010. The cost comprises of flight from City Z to Nashville (\$350.00), lodging (5 nights @ \$99.00), and food (5 days @ \$49.00/day).

Equipment (\$5,000.00)

For the purchase of a 96-well thermocycler to accommodate the large numbers of PCR-related experiments outlined in the project. The University donates the use of one ultra-high speed centrifuge, two high speed centrifuges, and three microcentrifuges, and one Biorad iCycler real-time PCR system (with a usage value of \$20,000.00) for the entire duration of the project as matching contributions for this project. All the equipment listed above is required for completion of the project.

Supplies (\$14,830.00)

The cost of greenhouse supplies for growing tomato plants are estimated at \$500.00. This includes 400 pots, soils (10-50 lb bags), and fertilizers (Osmocote, 5 lb). Laboratory supplies including chemicals, biochemicals, molecular biology reagents, enzymes, columns for RNA and DNA isolations, plant and bacterial media, plastic- and glass-ware, gel boxes and trays, are estimated at an average cost \$1,000.00 per month (\$12,000.00 per year). Funds are also requested for two sets of Gilson Pipetteman (each set consisting of 4 pipettes ranging from 1 µl to 1000 µl, \$1,165.00 for each set), totaling \$2,330.00.

Other (\$5,500.00)

A total of \$2,500.00 is requested to defray partial costs of publishing the results generated from the project. In addition, \$3,000.00 is requested for rental of the transgenic greenhouse at the University Agricultural Center (\$250.00 per month) which is necessary to carry out experiments on tomato plants.

Matching Funds

The University will contribute \$17,472.14 to this project, which consists of 20% of the PI's salary and fringe benefits.

Project Oversight:

The PI has extensive experience working with RNA viruses, RNAi-mediated viral resistance in plants, and molecular characterization of viral genes and functions. The experiments outlined in

this project are well within his area of expertise. The PI will direct and implement the project. Weekly meetings will be held between the PI, a research specialist, and other lab members involved in this project to assess its progress, and quarterly progress reports will be posted on the proposed website. The PI will periodically consult with the Departmental Business Manager to ensure that expenditures remain within budget categories and that funds are spent appropriately.

Project Commitment:

The project PI, will commit 0.2 FTE to administer the project, to supervise and conduct proposed experiments, to perform required data analyses, and to communicate research progress and findings to the sponsoring agency. Additionally, 1 FTE research specialist and two part-time undergraduate researchers will work on the proposed project. The administrative personnel at The University have extensive expertise in overseeing and administering contracts and grants from a variety of organizations.

Enhancing Sustainable Specialty Crop Production

Applicant:

Farm Extension & Research Center

Abstract:

Support training and field activities for farmers in a twenty-two county area in the northwest part of the State, which includes sustainable soil and water management, insect, disease, and weed management, fruit and berry applied research, and business planning.

Purpose:

The retail and wholesale demand for local and sustainable vegetables, fruit, and greenhouse crops is currently growing at a rate of 10 to 20 percent per year. In addition, consumer demand is strong for direct-from-the-farm products through farm stands, pick your own operations, community supported agriculture programs, and internet based sales. Yet, resources for hands-on training of new and diversifying farmers are limited and must be increased to satisfy increased demand.

The Farm Extension & Research Center and its flagship plant are capable of utilizing grant funds to enhance its current program offerings of 1) an intensive 8-week specialty crop workshop series and 2) an ongoing workshop series for specialty crop farmers in a 22-county area in the northwest region of the State. This would be a new endeavor, which has not received any other Federal or State grant funds.

Potential Impact:

Programs at the Farm reach out to a diverse group of participants:

- Tobacco farmers who are interested in diversifying to specialty crops
- Row crop, dairy, and beef farmers interested in diversifying to specialty crops
- Young farmers who do not have access to land or sufficient capital but are interested in organic & sustainable specialty crop farming
- Other traditional farmers who want to diversify
- Persons who want to farm as a second career
- Persons who want to farm in retirement

Based on the business plans developed by the enterprises at the Farm, average gross revenue was estimated at \$9,000 per acre. Given the early stage of the farm enterprises, it is likely that gross revenue will be greater than estimates in the first 3 to 5 years of operations. The program will conduct periodic surveys of all program participants and farm enterprises and request voluntary reporting of farm income related to the training program. In addition, gross revenue can be used to estimate infrastructure costs which are likely 2 to 3 times greater than gross revenue. The economic multiplier of infrastructure costs help to create economic activity for local farm supply businesses which helps keep farming communities to continue to thrive and allows farm supply businesses to remain profitable.

There are two levels of service that the program provides. One level is for the workshop series and apprentice farmers. A second level of service is for participants that wish to participate in individual workshops, mentor farmer presentations and field walks, as well as other

demonstration activities. It is estimated that over the three years of this project:

- At least 50 individuals will participate in the 8-week workshop series
- At least 75 individuals will participate in the independent workshops
- At least 5 enterprises will be created at the Farm Enterprise program
- At least 20 enterprises will be enhanced on participant-owned farms through participation in 8-week workshop series

Expected Measurable Outcomes:

1. Conduct 8-week workshop series in 2010 to at least 50 individuals for each workshop. Pre-training self-assessment tools (**BENCHMARK**) will be given to each participant after registration. Registration records, weekly attendance records, and pre and post workshop self-assessment knowledge evaluations (**PERFORMANCE MEASURES**) will determine if there has been a 40% mean increase in specific knowledge areas (**GOAL**).
2. Conduct 3 independent workshops in 2010 to be developed based on feedback from Goal 1 to at least 30 individuals for each workshop. Workshop evaluations from Outcome 1 (**BENCHMARK**) will help develop the workshops in outcome 2. Registration records, attendance records, and pre and post workshop evaluations (**PERFORMANCE MEASURE**) will establish if at least 50% of participants will use knowledge gained to improve or enhance their farm-related enterprise (**GOAL**).

Work Plan:

The Farm will use grant funds to support training and field activities that include sustainable soil and water management, insect, disease, and weed management, applied fruit and berry research, business planning, and development of enterprise budgets for new and diversifying farmers. The Farm will also contract with a part-time mentor farmer to reinforce the mentoring capacity of the program and allow for targeted expansion of trainings and workshops.

Support for apprentice farmers will include field preparation, fertilization with and incorporation of litter, field preparation for bedding, as well as bed shaping with drip tape, with/without plastic. Ongoing support will be provided to growers in market development, production issues, and farm infrastructure. In addition, apprentice farmers will be providing educational support through field walks and other demonstrations.

Project Activity	Who's Responsible	Timeline
Develop criteria and solicit applications for Mentor Farmer position	Planning Committee	Oct. – Dec. 2009
Plan 8-wk training series	Planning Committee	Oct. – Dec. 2009
Plan Workshops	Planning Committee	Oct. – Dec. 2009
Contract with Mentor Farmer	Planning Committee	Jan. – Mar. 2010
Conduct 8-wk training series	Planning Committee	Jan. – Mar. 2010
Annual Purchase of Supplies	CED & Smith	Jan. – Mar. 2010
Conduct Workshops	Planning Committee	Jan. – Sept. 2010

Project Activity	Who's Responsible	Timeline
Evaluate training series	Planning Committee	Apr. – June 2010
Evaluate Workshops	Planning Committee	July – Sept. 2010
Annual/Final Report	CED & Smith	July – Sept. 2010

Budget Narrative (Total \$22,800.00):

Funding Cycle FY10	Budget	Match
Supplies		
Garden Supplies	\$17,800.00	\$0.00
Total Supplies	\$17,800.00	\$0.00
Professional & Outside Services/Contractual		
Mentor Farmer	\$5,000.00	\$0.00
	0.00	0.00
Total P&O	\$5,000.00	\$0.00
TOTAL PROJECT COSTS	\$22,800.00	\$0.00
Program Income		
Registration Fees	\$2,500.00	\$0.00
Apprentice Fee	2,240.00	0.00
Total Program Income	\$4,740.00	\$0.00

Program Income will be reinvested into the program to support specialty crop farmers and help sustain and grow the project.

Supplies (\$17,800.00)

These funds will purchase items under \$5,000 that are needed for training programs on fruit, berry, and vegetable production at the Farm Extension & Research Center.

Item	Justification	Cost
Bedder	Planting Bed Preparation	\$ 1,500
Cool Bot/Walk in Cooler	Post Harvest Cooling of Produce	\$ 2,000
Cultivator	Tillage and Cover Crop Incorporation	\$ 1,200
Hand Tools	Crop Production and Weed Management	\$ 900
Hoop House	Season Extension	\$ 4,400
Irrigation Supplies	Upgrade Pump and Drip Irrigation System	\$ 1,100
Mulch Layer	Weed Management of Beds	\$ 1,500
Mulches, Biodegradable and Plastic	Weed Management of Beds	\$ 1,300
Rotary Mower	Weed and Cover Crop Management	\$ 1,800

Tiller	Planting Bed Preparation	\$	2,100
			<hr/>
			\$ 17,800
			<hr/>

Contractual (\$5,000.00)

A mentor farmer will be hired as a contractor at a flat rate to provide regular and consistent guidance to workshop participants and apprentice farmers. These activities will take place during the 8 week workshop.

Program Income (\$4,750.00)

Registration Fee for 8 week workshop series - \$2,500

Apprentice fee - \$2,240

The income derived from this project will be reinvested into the program to support specialty crop farmers and help sustain and grow the project.

Project Oversight:

The County Extension Director, Dr. Brown will be responsible for project oversight, with assistance provided by Dr. Smith, County Agricultural Economic Development Coordinator. Both individuals serve on the Planning Committee which has a monthly meeting schedule that will enable activities to be implemented in a timely manner.

Project Commitment:

The Farm Extension and Research Center is a successful collaboration between County Cooperative Extension and Economic Development, with support from State University's College of Agriculture and Life Science as well as the Center for Environmental Farming Systems. The Farm Planning Committee includes representation from the partner institutions and agencies and has a monthly meeting schedule to plan and implement programs at the Farm. Programs during the past 2 years demonstrate a strong commitment to developing the capacity at the Farm and promoting educational activities that support farm viability.

Establish a Super Berry Market in the State

Applicant:

Jane Smith

Abstract:

This project is designed to increase the production of organic Super Berries, aronia, saskatoons, raspberries, elderberries, currants and gooseberries in the State. This will be completed through the research and test value added products as well as the design an organic berry producers' interactive website in order to share methods, growing tips, and organic opportunities.

Purpose:

Nutritional antioxidant-rich foods are growing in demand from the consumer marketplace due to the health benefits and medicinal nature that super foods provide. Fruits containing high levels of anthocyanins and flavonoids with beneficial nutrients such as antioxidants, polyphenols, minerals and vitamins, are known as Super Berries. Research found that such berries contain compounds that fight degenerative diseases, heart conditions, and cancer. Research also indicated that consumer demand exceeds production levels producers can provide and that demand is expected to grow. Most super fruits in the market today are imported from other countries making them difficult to obtain.

For these reasons, it is becoming increasingly necessary to expand berry acreage that will produce Super Berries. It is important that we foster the development of this market for the State and the Region. Since this is a new endeavor, the submitted proposed project has not been presented to or funded by another Federal or State grant program.

Potential Impact:

There are growers presently in adjoining states producing limited amounts of aronia berries; however, the market is still in its infancy. To our knowledge, we are the only producers of the aronia, saskatoon and elderberries in the State. This grant will enable us to increase production efforts, which increase formal alliances with other area producers in order to obtain contracts with large juice and health/wellness processors.

Most berry plants take 2-4 years before their first measurable harvest; therefore, traditional farmers are reluctant to commit production farm ground to this type of specialty crop. It's our belief that as the market grows, the potential will be seen and farmers may be more willing to plant the healthy, alternative crop on their non-productive terrain as these berries thrive in timber woodlands, sand/gravel loams, etc. and can provide an additional income stream while taking up a minimal amount of acreage in order to be successful.

Each mature aronia bush produces up to 40 pounds of berries. We plan to increase production level to 2500 lbs of berries and help meet consumer demand.

Expected Measurable Outcomes:

1. Increase the number of growers and producers of Super Berries (**GOAL**) by assist in the establishment and development of 3 to 4 additional Super Berry producers by fall 2011 (**TARGET**). Currently, there is only one known grower of Super Berries in the State (**BENCHMARK**). This growth will be tracked through the creation of partnerships and berry establishments through the grant period (**PERFORMANCE MEASURE**).
2. Design and manage the growth of an online web portal to increase the awareness of Super Berry potential and related health benefits (**GOAL**). There is not any current data for the website portal (**BENCHMARK**); however, we expect approximately 150 website hits each month and an increase in the number Super Berry plant sales (**TARGET**). Project staff will track the monthly, website hits during the winter of 2011 through a tracking tool after the website is established in the fall 2011 (**PERFORMANCE MEASURE**).

Work Plan:

This project is planned to be executed in Spring of 2010 if funds are made available and activities will commence in late Fall 2011 with the exception of monitoring outcomes which will continue until Winter 2011.

Project Activity	Who's Responsible	Timeline
Make efforts to gain/share knowledge, build relationships with area farmers, alternative crop producers and institutions interested in research and development	Jane Smith and Ronald Smith	Mar. 2010 – Dec. 2012
Design and maintain web portal to increase awareness, share opportunities and increase marketability	Jane Smith, Web Design, and Maintenance Contractor	March 2010
Prepare ground to be planted after soil thaws	Jane Smith and labor	March 2010
Purchase plants and plant in two separate plantings	Jane Smith and labor	May – Sept 2010
Cage and stake individual seedlings with possible mulching	Jane Smith and labor	May – Sept. 2010
Research organic farming requirements and apply for organic certification	Jane Smith	Oct. 2010
Launch Web Portal	Jane Smith, Web Design, and Maintenance Contractor	Dec. 2011

Outreach activities will be performed on a continual basis. These activities will include on-farm demonstrations and tours for potential producers as well as trips to establish partnerships with other Super Berry producers.

Budget Narrative – (Total \$13,390.50)

Funding Cycle FY10	Budget	Match
In-State Travel		
Lodging	500.00	0.00
Meals	305.00	0.00
Mileage	912.25	0.00
Total In-State Travel	\$1,717.25	\$0.00
Supplies		
Planting Supplies	\$3,540.00	\$3,540.00
Recipe Testing Supplies	1,500.00	1,500.00
Total Supplies	\$5,040.00	\$5,040.00
Professional & Outside Services/Contractual		
Equipment Rental	\$1,200.00	\$1,200.00
Labor	\$1,800.00	\$1,800.00
Domain Name Purchase	\$625.00	\$625.00
Website Design and Maintenance	3,000.00	3,000.00
Total P&O	\$6,625.00	\$6,625.00
TOTAL PROJECT COSTS	\$13,382.25	\$11,665.00

Travel (\$1,717.25)

Travel is required to establish partnerships, research and observe growing methods and organic opportunities of Super Berry plantations. We will also attend the annual aronia berry festival held in Sept. 2010 that includes guest speakers from around the country on the super berry potential, health benefits, marketing and organic opportunities.

Purpose of Trip: 4 trips to the X Berry Farm in City A in State B as it is the largest super berry plantation in our region. These trips would be to pick up plants, examine how the berry farm is managed, organic fertilizer options and demonstrations of the equipment needed for a super berry plantation.

Number of people travelling: 2

Number of days travelling: 2

Estimated lodging and meals: lodging **\$200.00** and meals **\$100.00**

Estimated mileage: 800 miles @ \$0.445/mile

Purpose of Trip: Tour other alternative sustainable farms in our region to educate ourselves on how other sustainable farmers manage their acreages. This will assist in developing partnerships with other growers.

Number of people traveling: 2

Number of days travelling: 1 day

Estimated Mileage: 400 miles @ \$0.445/mile

Estimated lodging: Meals: **\$80.00**

www.azda.gov

Purpose of Trip: Attend 3-4 sustainable garden tours such as the Horticulture Exposition held in City A in State B in the spring of each year. Such tours also exist in City C in State B.

Number of days traveling: These tours are usually 2-3 day events where guest speakers come from across the country to speak on various gardening and sustainable farming subjects.

Estimated Mileage: 850 miles @ \$0.445/mile

Estimated lodging and meals: 3 nights lodging **\$300.00** and meals **\$125.00**

Supplies (\$8,040.00)

To establish gardens the project will need: 2000 Additional Super Berry Plants @ \$2.00 average wholesale cost each (**\$2,000.00**), organic fertilizer (**\$1,000.00**), temporary reusable plant surrounds for wildlife protection (deer/rabbits) for young berry plants (24 rolls 24'x150' galvanized mesh wire @ \$35.00 per roll x 50% = **\$420.00**), ground garden staples to hold caging material down (4 boxes – 1000/pack @ \$59.99 each x 50% = **\$120.00**).

For recipe testing and researching marketable organic products (such as jams, juice blends, fruit chews, and nutritional supplements) the project will need canning jars, pectin, sugar and various ingredients to make recipes and organic products (**\$1,500.00**).

Contractual (\$3,625.00)

The project will need to rent equipment (**\$1,200.00**), use contract labor (**\$1,800.00**), purchase a Domain name (**\$1250.00**), and design and maintain a website (**\$6,000.00**).

	Grant Resources	Applicant Resources
2 year Domain name purchase (\$70.00) + Internet/hosting fees for 2 years @ \$49/month	\$ 625.00	\$ 625.00
Website Design & maintenance: Online web portal for organic berry producers to network, share methods, growing tips, organic opportunities.	\$ 3,000.00	\$ 3,000.00
Equipment Rental for tilling and planting garden plots	\$ 1,200.00	\$ 1,200.00
Contract labor to prepare ground necessary for planting, and some tree removal and tillage	\$ 1,800.00	\$ 1,800.00
TOTAL	\$ 6,625.00	\$ 6,625.00

Matching Funds (\$11,665.00)

The applicant will provide 50% matching funds for supplies and contractual work totaling \$11,665.00.

Project Oversight:

Jane Smith will oversee the plantings and establish partnerships, research and observe growing methods, and organic opportunities of Super Berry plantations. She will also prepare quarterly reports on the developments resulting from the activities of this project.

Project Commitment:

Having owned other successful business ventures over the years, Jane Smith Farms has always grown businesses slowly but debt free, ensuring all funds are spent wisely and appropriately with a separate business account. These practices will be continued in order to ensure that the funds from the SCBGP are used solely for this project.

Training Series to Increase Local Fruit and Vegetable Production at the Local Market

Applicant:

Specialty Crop Extension Organization

Abstract:

Educate current and potential farmers about transitioning to specialty crop production for local consumption.

Project Purpose:

In order to meet the growing demand for locally-produced, fresh fruits and vegetables in the local area, the project will support farmers that plan to convert to specialty crops by providing educational workshops and field visits to commercial vegetable/fruit farms and field trips to the State University Research and Extension Center. Particularly, the focus will be on these growers need of an agricultural enterprise that can reliably generate profit. A successful transition to a comparable crop is needed to ensure that the economic well-being of these growers is preserved. Local producers in the State were dealt an unpleasant hand last year, when their longtime buyer, Corporation A, informed the State producers that no further contracts would be issued in the State. This created uncertainty in the establishment of a buyer willing to pay a fair price for local crops. The 2007 USDA Census of Agriculture reported that at least 25 percent of the State's crop production will be affected by this change in purchaser. As such, Corporation A's withdrawal will have an incredible impact on the value of agricultural production for this area of the State.

Fortunately, the growth in the number of farmers' markets and community supported agriculture ventures in this region currently outpaces the national average and local retailers and institutional buyers continue to seek locally grown fruits and vegetables. In fact, some producers are dabbling in specialty crops like sweet corn and melons, which increasingly requires a strong educational effort to inform these farmers of the challenges that they will face in their transition. This project has not been submitted for funding elsewhere.

Potential Impact:

The local fresh fruit and vegetable market is far from saturated and this project has the potential to impact not just participating farmers, but also local consumer markets throughout the west-central region of the State. Specifically, the farmers/potential producers that participate in the project will directly be impacted by becoming more knowledgeable about production practices and marketing options. There are currently more than 150 producers in the State, and 100 of these growers are members of the Commodity of America (CA) and/or the Growers Association (GA). Also, 40 new producers (not members of CA or GA in the State) have been identified. Because the value of specialty crops in comparison to traditional row crops is considerably higher, participants that elect to pursue fruit/vegetable production over other on-farm enterprises will increase their profit potential, thereby increasing their quality of life. Most importantly, former producers will become more confident in their ability to produce and market crops with a similar economic value.

Expected Measurable Outcomes:

Participants will become more knowledgeable about production practices of various specialty crops including vegetables and fruit (**GOAL**). They will also increase their awareness of specialty crop marketing opportunities. Currently, there is not any **BENCHMARK** data to compare this increase in knowledge or awareness; therefore, these short-term outcomes will be measured through a pre- and post-assessment of the participants' knowledge and awareness concerning production practices and marketing. We plan to achieve an increase of 75 percent in both knowledge and awareness (**TARGET**). These surveys will utilize multiple choice and yes/no questions as well as the Likert Scale in order to collect data (**PERFORMANCE MEASURE**).

Work Plan:

There are two primary parts of this project: 1) Educational Workshops held at the County University Extension Center, and 2) Two in-season Field Visits to commercial vegetable/fruit farms and Field Trips to the State University Research and Extension Center. Additionally, participants in the project will be granted admission to the 2010 Specialty Crop Conference.

Workshops (November and December 2009)

The workshops will be a concerted effort on the part of the Extension's multidisciplinary faculty, other state institutions dedicated to nurturing the furtherance of State specialty crop production (University Extension), and industry personnel. There will be a total of three 4 hour workshops.

The first workshop will cover production practices for specific specialty crops commonly seen in the local food market (corn, tomatoes, beans, melons, etc.) Participants will gain a fundamental understanding of the production schedules for these crops from transplant production to harvest. University Extension Specialists committed to presenting information on production practices and profitability include Dr. Joe Smith, Horticulture Specialist, and Dr. Jane Smith, Horticulture Specialist.

The second workshop will introduce alternative agriculture products with additional information concerning high tunnel technology. Participants will become familiarized with a host of alternative commodity (i.e. Aronia berries, ethnic vegetables, etc) production through high tunnel technology. The high tunnel ability to extend production seasons and protect crops from environmental stresses makes them practically an essential tool for sustainable, local food producers. Industry personnel that have committed to this workshop include: Mr. Bob Smith and Ms. Betty Smith of Corporation B.

The third workshop will cover numerous market opportunities to sell specialty crops: specifically, farmers markets, on-farm sales, wholesale distribution, and cooperatives. Participants will increase their understanding of the variety of avenues available to specialty crop producers for selling their products. The University Extension Specialists committed to presenting information at this workshop is Ms. Mary Smith, Community Development Specialist. The industry personnel committed to this workshop is Mr. Mark Smith of Corporation C.

Field Trips (June and July 2010)

There will be two in-season field trips to commercial vegetable/fruit farms. Participants will observe operations and gain a more complete understanding of commercial vegetable/fruit operations. This is a fundamental part of the project because many growers have indicated that

they are more likely to enter into specialty crop production after they have been educated and after they have seen examples of how it is done.

Farm Visits (May 2010)

There will be two other visits to specialty crop marketing and production sites. The first visit will be to the State University Research and Extension Center to learn about specialty crop production equipment. This trip will coincide with the May session of the Growing Growers Workshop Series. The second trip in May will be to the local produce auction site. Participants will watch as local produce and other local items are auctioned off. The auction manager has agreed to visit with the group about the auction process as well. In addition to seeing the produce auction, the Horticulture Specialist (Dr. Joe Smith) arranged two stops at specialty crop farms to visit with current growers.

Vegetable Growers' Conference (January 2011)

To supplement the education received during the workshops, participants will be granted full admission to the Vegetable Growers' Conference. This conference is coordinated by the Horticulture Specialists of State University Extension, and state specialists from four other regional universities. At this conference, participants will have the opportunity to immerse themselves into specific areas of production, harvesting, and marketing, as well as have the chance to network with fellow growers.

Budget Narrative (\$12,669.00):

Funding Cycle FY10	Budget	Match
Personnel		
University Extension Specialist (Dr. Joe Smith .10 FTE)	\$1,600.00	\$0.00
University Extension Specialist (Dr. Jane Smith .05 FTE)	943.00	0.00
Total PS	\$2,543.00	\$0.00
Employee Related Expenses - Fringe Benefits		
University Extension Specialist (Dr. Joe Smith 29.05% ERE)	465.00	0.00
University Extension Specialist (Dr. Jane Smith 29.05% ERE)	274.00	0.00
Total ERE	\$739.00	\$0.00
In-State Travel		
Mileage	1,463.30	0.00
Total In-State Travel	\$1,463.30	\$0.00
Supplies		
Notebooks	\$200.00	\$0.00
Total Supplies	\$200.00	\$0.00
Other Operating Expenses		
Evaluation Costs	\$100.00	\$0.00
Education and Training	6,400.00	0.00

Printing	75.00	0.00
Total OOE	\$6,575.00	\$0.00
 TOTAL PROJECT COSTS	 \$11,520.30	 \$0.00

Personnel (\$2,543.00):

University Extension Specialists Dr. Joe Smith and Dr. Jane Smith seek salary recovery consistent with their estimated time of commitment to the project. Dr. Joe Smith's estimated time spent on the project is 0.1 FTE (\$1,600), and Jane Smith's estimated time spent on the project is 0.05 FTE (\$943).

Fringe Benefits (\$739.00):

State University's negotiated federal fringe rate is 29.05% of salary costs: Dr. Joe Smith, Horticulture Specialist (\$465); Dr. Jane Smith, Horticulture Specialist (\$274).

Travel (\$1,463.30):

The estimated mileage for each speaker/coordinator is broken down by workshop. Mileage for these speakers is figured at the state rate of \$0.445/mile traveled. Speakers will not be granted reimbursement for meals.

Workshop 1:

There will be a speaker from City A (320 miles roundtrip) as well as two speakers and 1 coordinator traveling separately from City B (60 miles roundtrip per person) (\$222.50).

Workshop 2:

There will be a speaker from City C (290 miles roundtrip) and two speakers travelling together from City B (60 miles roundtrip). Also, two coordinators will travel separately from City B (60 miles roundtrip per person) (\$209.15).

Workshop 3

There will be a speaker from City C (290 miles roundtrip), a speaker from State B (240 miles roundtrip), a speaker from City A (320 miles round trip), as well as a speaker and coordinator travelling separately from City B (60 miles roundtrip per person) (\$431.65).

It is estimated that approximately 25 farmers/potential farmers would participate in the trip to the produce auction. The round trip travel from City B to City D is estimated to range from \$600-\$850. We have planned for the lowest end of those estimates and request \$600 to cover the cost of chartering a bus. Though this trip will be over the lunch hour, we will require that participants be responsible for their own lunch.

Supplies (\$200.00):

Because we want the information that is presented to the participants to be readily available to them and in one place, we will purchase forty notebooks at \$5 (\$200).

Other (\$6,575.00):

Workshop expenses will include the price of extension publications as reference materials, and printing expenses incurred by the University Extension. The facility is free for us to use. Extension publications for 40 participants will cost \$200. Printing costs incurred by the University Extension for presentations and other resources is estimated to be \$75.

For evaluation purposes, the expenses incurred for stationary, printing, and postage is estimated to be **\$100**.

The Vegetable Growers' Conference is a three-day conference where participants will be granted admission to the conference; however, they are responsible for their own travel, accommodation, and meals. A community supported agriculture session will be held on Thursday (\$65), while a wide array of breakout sessions will be held on Friday and Saturday (\$35 each). It is estimated that there will be 40 participants for this conference (**\$5,400**).

Our effort to publicize the project will encompass a variety of avenues including print, radio, and electronic forms of communication. Flyers will be produced to highlight the schedule of activities and solicit registrations. The cost for producing the flyers will be incurred by the University Extension (**\$200**).

The Growing Growers workshop is held at the State University Horticulture Research and Extension Center outside of City F where participants (40) can see demonstrations of various production practices. Participants will be responsible for their own transportation to this event. Registration for this workshop is \$15 per participant (**\$600**).

Project Oversight:

State University currently monitors more than \$200 million in grant expenditures from federal, state and other sources. It maintains a post award staff at division and system levels (in addition to many department levels) to ensure that expenses incurred are appropriate, allocable and allowable. The University conforms to state and federal compliance regulations such as the cost principles for college and universities (2 CFR 220 – OMB Circular A-21). The activities for the project will also be overseen by University Extension Specialists. Dr. Joe Smith and Dr. Jane Smith regularly host workshops and work with producers on a daily basis. Smith will be responsible for project advertisement, production of handouts, meals for workshops, evaluation, travel arrangements, and organizing the workshops. Smith will work with Smith in advertising and evaluating the project, organizing the workshops, and will be responsible for arranging field visits to commercial farms.

Project Commitment:

The University Extension is dedicated to increasing the quality of life all these growers over the course of this project. Specifically, the Extension field staff is very committed to seeing that these growers can replace their income. The team of educators that have already been identified readily communicated their interest in participating in this project. By bringing together Extension, the State, and industry personnel for this common goal, we feel that we can deliver a high-caliber program that complements the capacity of local agents.